

WHAT IS CLAIMED IS:

1. A control system for an automatic transmission, comprising:

a forward/backward changeover mechanism for switching between a forward mode for causing a vehicle to travel forwards and a reverse mode for causing the vehicle to travel backwards;

a detecting device which detects a vehicle speed;

a range selector which selects one of a forward range and a reverse range;

a detecting device which detects a position of the range selector;

a counter which measures a period of time that the range selector has continued to remain at the forward range; and

a controller functioning to:

make a judgment whether or not the range selector has been switched to a reverse range during forward traveling of the vehicle,

make a judgment whether or not the detected vehicle speed is lower than a first vehicle speed and whether or not the period of time that the range selector has remained at the forward range until switching is shorter than a predetermined judgment time when it is determined during forward traveling of the vehicle that the range selector has been switched to the reverse range, and

switch the forward/backward changeover mechanism to the reverse mode when it is determined that the detected vehicle speed is lower than the first vehicle speed and that the period of time that the range selector has continued to remain at the forward range until switching is shorter than the predetermined judgment time, and, otherwise, delay the switching of the forward/backward changeover mechanism to the reverse mode.

2. A control system according to Claim 1, wherein the controller further functions such that, when it is determined that a detected vehicle speed is lower than the first vehicle speed and that the period of time that the range selector has continued to remain at the forward range until switching exceeds the predetermined judgment time, the switching of the forward/backward changeover mechanism to the reverse mode is delayed until the detected vehicle speed becomes lower than a second vehicle speed that is lower than the first vehicle speed.

3. A control system according to Claim 1, wherein the controller further functions such that, when it is determined that a detected vehicle speed exceeds the first vehicle speed, the switching of the forward/backward changeover mechanism to the reverse mode is delayed until the detected vehicle speed becomes lower than a second vehicle speed that is lower than the first vehicle speed.

4. A control system according to Claim 1, wherein

the forward/backward changeover mechanism comprises

a forward frictional engagement element engaged for causing the vehicle to travel forwards,

a backward frictional engagement element engaged for causing the vehicle to travel backwards, and

an oil pressure adjusting mechanism for controlling an oil pressure supplied to the forward frictional engagement element and an oil pressure supplied to the backward frictional engagement element, wherein

the forward/backward changeover mechanism switches between the forward

mode for causing the vehicle to travel forwards and the reverse mode for causing the vehicle to travel backwards by controlling the oil pressure supplied to the forward frictional engagement element and the oil pressure supplied to the backward frictional engagement element.

5. A control system according to Claim 4, further comprising a detecting device which detects a rotation speed of an engine, wherein

the controller further functions to:

when the engine rotation speed has become lower than a second vehicle speed which is lower than the first vehicle speed, if the engine rotation speed exceeds a racing judgment value, reduce a torque of the engine, and then switch the forward/backward changeover mechanism to the reverse mode.

6. A control system according to Claim 1, wherein the first vehicle speed is set to a lower vehicle speed limit at which a driver is expected not to switch the range selector to the reverse range.

7. A control system according to Claim 2, wherein the second vehicle speed is set to an upper vehicle speed limit at which no speed reduction exceeding a permissible limit is caused even when forward/backward changeover mechanism is switched to the reverse mode during forward traveling of the vehicle.

8. A control system according to Claim 3, wherein the second vehicle speed is set to an upper vehicle speed limit at which no speed reduction exceeding a permissible limit is caused even when forward/backward changeover mechanism is switched to

the reverse mode during forward traveling of the vehicle.

9. A control system according to Claim 5, wherein the second vehicle speed is set to an upper vehicle speed limit at which no speed reduction exceeding a permissible limit is caused even when forward/backward changeover mechanism is switched to the reverse mode during forward traveling of the vehicle.

10. A method of controlling an automatic transmission having a forward/backward changeover mechanism which switches between a forward mode for causing a vehicle to travel forwards and a reverse mode for causing the vehicle to travel backwards, and a range selector which selects one of a forward range and a reverse range, the method comprising:

making a judgment whether or not the range selector has been switched to the reverse range during forward traveling of the vehicle,

making a judgment whether or not a vehicle speed is lower than a first vehicle speed and whether or not the period of time that the range selector has remained at the forward range until switching is shorter than a predetermined judgment time when it is determined during forward traveling of the vehicle that the range selector has been switched to the reverse range, and

switching the forward/backward changeover mechanism to the reverse mode when it is determined that the vehicle speed is lower than the first vehicle speed and that the period of time that the range selector has continued to remain at the forward range until switching is shorter than the predetermined judgment time, and, otherwise, delaying the switching of the forward/backward changeover mechanism to the reverse mode.